

A very typical scenario and partially correct. BUT a great explanation of the two materials!

Epoxy vs Polyurethane

Epoxy vs polyurethane is a common topic brought up during many conversations. Often, we will receive a call from a customer or a facility manager who has been tasked with coating his or her production floor. The conversation usually starts off something like this:

“I need you to take a look at my concrete floor,” the facility manager says. “Its bare concrete and we need it to be durable, bright, safe and easy to clean. I’ve been researching products on your website. Which coating would you recommend?”

“For a general industrial or commercial application, the vast majority of the time I would recommend, at minimum, a three coat system consisting of an epoxy primer, an epoxy build-coat and a polyurethane topcoat,” I respond.

“I thought all floor coatings were ‘epoxy’,” the facility manager quips. “What’s the difference with epoxy vs polyurethane coatings?”

In the industrial floor coating world, while epoxies and polyurethanes are both thermosetting polymers, their differences in function and performance are vast. For concrete floor coating applications, the most durable, longest-lasting coating systems usually include the use of both epoxy and polyurethane.

Epoxy Coatings

There are a number of different epoxy floor coatings on the market today, with costs that are all over the map. In very simple terms, a typical two-part epoxy coating contains a resin side and a hardener side. These two components are thoroughly mixed together, applied to the concrete floor, and allowed to cure. There are certainly different types of epoxy coatings formulated to address a different desired performance result. These range from flexible epoxies, to chemical-resistant epoxies, to fast-setting epoxies, etc.

From a form and function standpoint, epoxies are very good at three things:

- **Bonding to Concrete:** Provided the concrete substrate is properly prepared to receive a coating, epoxies are excellent for mechanically bonding to concrete. This creates a well-adhered system base that will allow subsequent build and topcoats. A complete coating system is only as good as its initial bond to the concrete substrate. Of course, concrete preparation is a crucial part of establishing a proper bond. We recommend concrete preparation by mechanical means, such as diamond grinding or abrasive shot blasting methods.

- **Build/Thickness:** Epoxy build coats are typically installed at 8 to 15 mils per application. This thickness allows the coating to chemically bond to the epoxy primer, and is thick enough to self-level and fill minor concrete blemishes and hairline cracks. Depending on the desired performance requirements and condition of the concrete, more build coat applications may be desired. Upon curing, the epoxy build coat(s) provide a hard, durable surface.
- **Installation & Performance:** Upon curing, the epoxy build coat(s) provide a hard, durable surface with good impact resistance. Epoxies are fairly easy to install, exhibit ample working time, and are fairly cost-effective when compared to other industrial flooring solutions.

On the other side of the coin, epoxies are sensitive to UV light so they will amber or yellow over time when exposed to sunlight. They are also not as abrasion and chemical-resistant as polyurethanes.

Polyurethane Coatings

Though they exhibit much thinner cured-film thickness, polyurethanes offer a number of unique advantages over epoxies.

- **UV Stability:** Polyurethanes exhibit excellent UV-resistance. When used as a topcoat over epoxy, they protect the underlying epoxy from yellowing over time.
- **Chemical-Resistance:** Polyurethanes are resistant to a broader range and concentrations of chemicals. Additionally, they offer excellent resistance to staining from hot or cold tires.
- **Increased Impact and Abrasion Resistance:** Polyurethanes exhibit excellent impact and abrasion resistance, providing up to four times longer life than uncoated epoxy floors.
- **Finishes:** Polyurethane finishes can range from satin to semi-gloss to high-gloss. Optional wear and safety additives can be incorporated into the topcoat texture.

With the number of advantages polyurethanes have over epoxies, why would one choose one coating technology over the other?

It's not a matter of choosing one over the other, but a matter of utilizing both to achieve the desired result: Epoxy primers for bonding the system to concrete, epoxy build coat(s) for total

system build/thickness, and polyurethane topcoats for enhanced physical performance, chemical-resistance, safety and aesthetics.

Overall, epoxies are the preferred materials for priming properly prepared concrete substrates, and providing 'build' or film thickness that can hide small blemishes or hairline cracks on the concrete surface. Polyurethanes provide the enhanced performance characteristics that protect the entire system. In fact, in many cases, if the epoxy primer and build coats are well-bonded, a simple re-coat of the polyurethane topcoat may be all that is required every few years, depending upon use. Polyurethanes are the "icing on the cake".

When it comes to epoxy vs polyurethane coatings, the important take-away is to realize that both product technologies work well in conjunction with each other to produce a durable, long-lasting flooring solution!